May 2021

Lesson Plan - M10_1

LESSON #1: ASSESSING THE GARDEN SITE and INITIAL BIODIVERSITY INVENTORY

OVERVIEW:

The purpose of this lesson is to outline how to conduct a site assessment and biodiversity inventory before planting a garden. It is important to assess what is already at the planting site, especially the existing plants, soil composition, amount of sun and shade exposure, the available space, and the water resources available. These elements are limiting factors that will determine the outcome of the garden. Also vital is a biodiversity inventory of the organisms at the site and those that visit the site by soil, land, and air.

As part of the site assessment, students will create a two-dimension drawing of the site. In addition, a biodiversity inventory will be taken, which will give students a good idea as to what is already there. Both these initial activities will help in the decision-making phase for the type of garden to choose for the site (Lesson 2) and the creation of the vision for the garden (Lesson 3).

This total site assessment and biodiversity inventory will include identifying:

- *Soil composition*
- *Type of Habitat*
- *Sun and Shade Exposure*
- *Weather, Climate, Season*
- *Available space*
- *Human-made elements*
- *Trash and Pollution*
- *Water resources / Irrigation system*
- *Existing plants*
- *Animals (Insects, Mammals, Birds, Reptiles, Amphibians)*

SUB-QUESTION:

What biotic, abiotic, and man-made elements are at our garden site?

WAYS OF KNOWING URBAN ECOLOGY:

	Students will…
Understand	. Identify the existing elements at the school site.
Talk	. Discuss the differences between biotic, abiotic, and human-made elements.
Do	. Create a two-dimensional drawing of the site.
Act	. Collect and dispose of any trash that may be found. . Work with school or community leadership to eliminate any sources of pollution at the site.

SAFETY GUIDELINES:

Review field guidelines when taking students outside to do any site visit.

PREPARATION:

Time: 3 class periods

MATERIALS (enough for # groups @ 4 in each group):

Activity 1.1:

- PowerPoint to review garden site elements
- Projector to show PowerPoint presentation
- Devices for students (in pairs) to conduct on-line research

Activity 1.2:

- Site Assessment Data Sheets
- Lists of common plants and animals found at school site area
- Soil Types Reference Sheets
- Hand shovels for digging / assessing soil
- Measuring tapes
- Field Guidelines
- Role Cards (for 4-person groups)
- Clipboards

- Pencils

Activity 1.3:

- Flip Chart paper
- Flip Chart markers

INSTRUCTIONAL SEQUENCE:

Activity 1.1 *(1 class period)* - Building Background: Teachers will talk about the following elements that will be assessed during the site visit and the biodiversity inventory that will be conducted (*use PowerPoint to guide instruction):*

1. **Making Physical Observations of the Site:** The bulk of data that students will gather during the site assessment will be on the *physical aspects* of the site. This include what it looks like, including the *characteristics* of the site or around the site such as: shape; size; human-made elements on the site; type of soil; the amount of sun and shade exposure; and water resources that may be available, including any irrigation system. *Students will create a two-dimensional drawing of the site during Day 2.*
2. **Weather and Climate:** Current *weather conditions* during the site assessment are important, as well as the *season* that planting will be done, and the *typical climate* of the area during the planting season. Weather events and climate play a large role in determining the type of garden to plant and will guide what plants to choose for the garden, and what animals may use the garden for a habitat or a food source.
3. **Terrestrial Habitat:** There are many different habitats that make up terrestrial (land) environments. *Habitat* is the place or type of environment where an organism typically lives. These are defined by the *predominant features* of the area. For example, forest habitats are dominated by tree species, while a field habitat is dominated by grasses. Have students identify the habitat(s) at the garden field site.

4. **Trash:** Hopefully there is no trash at the planting site, but if there is, this will need to be noted on the Site Assessment Data Sheet, and a plan put in place to remove it. Trash is present at many sites and should not be a deterrent to conducting ecological studies. Even a pristine site may at some point have trash blown in by the wind or carried in by an animal. Talking about the *impact of humans on the environment,* and how trash can affect an area, is an important discussion to have with students.
5. **Pollution:** No sites remain untouched by humans. Even those sites that are termed ecologically pristine are not free from human impact. Identifying *sources of pollution* at a field site will help answer questions about behavior and distribution of the organisms found there. Some sources of pollution found outside the perimeter of the site may still have an impact on the site itself. For example, an industrial pipe outside the site that is draining into the site, could be bringing in pollution. Students will need to explore the garden site and research areas around the site to determine if there is any possible impact from pollution.
6. **Biodiversity Inventory:** Students will document all the plants and animals they see at the garden site. Animals to include are insects, mammals, birds, reptiles, and amphibians. *Common plants and animals that may be found at the school site will be reviewed on Day 2.*
7. **Biotic vs. Abiotic vs. Human-made Elements:** Students should be introduced to the terms biotic (living) vs. abiotic (non-living) elements that may be found on a school site, as well as human-made elements (such as water fountain, irrigation system, benches …). These terms will be defined and an example of each in the PowerPoint teachers may use as a reference.

Summary Notes / Conclusion: By the end of Lesson 1, students will be able to (SWBAT):

- Name and define the various elements that would be assessed during a site assessment
- Describe the difference between weather and climate
- Research typical weather and climate trends for school's garden site
- Understand the characteristics of the seasons
- Define a habitat and discuss various types of habitats
- Explain human impact on the environment (trash, pollution)
- Define and discuss the differences between biotic, abiotic, human-made elements

Activity 1.2 *(1 class period*) - Site Assessment: Now is the time to conduct the site assessment and biodiversity inventory. Students will use the *Site Assessment Data Sheet* to write down data collected. Before heading outside, *field safety guidelines* should be reviewed with students, as well as the *reference sheet for soil types and common list of plants and animals* that may be found at the site. In summary, before taking students out to the garden site, all resources to be reviewed, include:

- site assessment data sheet
- field guidelines
- reference sheet for soil types
- common list of plants and animals that may be found at site

Students should be grouped into four-person groups, with specific responsibilities assigned during the assessment as outlined on *Role Cards,* described below:

- **Scribe/Recorder:** This student will write down all data on the Site Assessment Data Sheet that will be shared with the whole group on Day 3. This student will also sketch a draft two-dimensional

drawing of the site and consult team members for completion of the final version.

- **Observer:** This student will be the eyes and ears of the team; he/she will observe what is happening at the site, such as weather conditions, animals moving into, on, or off the site, assessing the type of habitat, amount of sun and/or shade exposure, human-made elements, water resources, and making general observations on trash, pollution, or other elements for the scribe to write on the data sheet.
- **Timekeeper/Facilitator:** This student will look at the data to be collected, set a time for each element, keep track of the time schedule, and keep the team members on track if they veer off task.
- **Data Collector:** This student will be responsible for the collection of the numeric and other measurable data, such as the size of the site, soil composition, animals observed in the soil, plants present at the garden site, and other elements. The observer and data collector will work very closely together, to provide information to the scribe/recorder during the assessment.

Activity 1.3 *(1 class period)* – Two-Dimensional Drawing, Group Data Collection and Review: Day 3 will be for groups to finalize their two-dimensional drawing of the garden site, and to review all data collected and documented by their team. The teacher will then chart each group's data on a master flip chart paper at the front of the room, so a discussion can occur about the results of the site assessment and biodiversity inventory. The results of the inventory in terms of sun and shade exposure, soil composition, water resources available, etc., will drive the decisions to be made in Lesson 2 on the type of garden that will be a best fit for the garden site. The collective Biodiversity Inventory should be posted in the classroom, for later reference when doing the Post-Planting Biodiversity Inventory in Lesson 9.

Lesson Standards Alignment (CA-NGSS): See Chart at beginning of Module 10.

Lesson Adaptation and Extensions: See Chart at beginning of Module 10.